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THE GENUS *DALEA* (FABACEAE) IN ALABAMA

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ABSTRACT

The primary objectives of this project were to determine which species of *Dalea* (Fabaceae) occur in Alabama and to report the county distribution of each. *Dalea*, known commonly as prairie clover, is recognized as including eight taxa in Alabama. The most common species are *Dalea pinnata* var. *triloba, D. purpurea* var. *purpurea,* and *D. candida.* The less common species are *D. albida*, *D. gattingeri*, *D. mountjoyae*, *D. foliosa* and *D. cahaba.* The dichotomous key and descriptions we present are modifications from earlier authors; however, all measurements are based on morphological features of the vegetative and reproductive structures of the more than 300 Alabama specimens studied during this project. Data for the county-level distribution maps were compiled entirely from herbarium vouchers.

KEY WORDS: *Dalea*, Fabaceae, floristics, legumes, systematics, Alabama

Commonly known as prairie clover, *Dalea* consists of approximately 160 species in the New World from Canada to Argentina (Barneby 1977). Of these, 62 species have been reported from the USA (NatureServe 2012), 15 species from the southeastern USA (Isely 1990), and 7 species and 3 varieties from Alabama (Kral et al. 2011).

The genus *Dalea* was established in 1758 in honor of Samuel Dale, when the editor of *Opera Varia*, inadvertently validated the name *Dalea* Linnaeus. *Dalea* Linnaeus (1737) has also been widely used in the literature, but Linnaeus, in all of his major works from 1753 forward, rejected *Dalea* Linnaeus. Barneby (1977) pointed out there is no reason to disqualify *Opera Varia* as a valid publication and since the editor was anonymous, the name Lucanus was used as the authority because of the location of the publication.

Dalea is a member of the legume family (Fabaceae, Leguminosae), subfamily Papilionoideae, and the New World tribe Amorpheae (McMahon & Hufford 2004). Prior to Barneby (1977), members of Amorpheae were placed in the tribes Daleae and Psoraleeae (in part). Barneby united the two tribes based on the presence of (a) epidermal glands throughout the plant body, (b) dry, indehiscent fruits with a single seed, and (c) terminal inflorescences. The monophyly of Amorpheae is supported by trnK/matK sequences data (McMahon & Hufford 2004), which confirms Barneby's hypothesis that that the tribe is a natural group.

Three species of *Dalea*, *D. cahaba* J.R. Allison, *D. foliosa* (A. Gray) Barneby, and *D. gattingeri* (Heller) Barneby have received a state and global rank of S2G2, S1G2G3, S3G3G4, respectively (Alabama Natural Heritage Program 2012). In addition, *D. foliosa*, which occurs in Alabama, Illinois, Tennessee, and Wisconsin, is a federally listed endangered species (U.S. Fish & Wildlife Service 1996). *Dalea cahaba* is endemic to Alabama and is known from only a few Ketona

Dolomite Outcrops in Bibb County (Allison & Stevens 2001). *Dalea gattingeri* has been reported from Alabama, Arkansas, Georgia, Missouri, and Tennessee (NatureServe 2012).

The primary objectives of this study were to determine which species of *Dalea* occur in Alabama and report the county-level distribution of each. Additional goals included providing a dichotomous key, species descriptions, and photographs for the taxa of *Dalea* found in Alabama.

Materials and methods

Data for the distribution maps were gathered from more than 300 plant specimens deposited in the herbaria of Troy University (TROY), J.D. Freeman (AUA), The University of Alabama (UNA), The University of West Alabama (UWAL), Jacksonville State University (JSU), Anniston Museum of Natural History (AMAL), University of North Alabama (UNAF), Samford University (SAMF), and Southern Methodist University (SMU) and Vanderbilt University (VDB), both of which are housed at the Botanical Research Institute of Texas (BRIT) in Fort Worth.

The dichotomous key is a modification of Isely (1990) and Weakley (2012); however, all measurements are based on morphological features of the vegetative and reproductive structures of the plants examined during this project. Descriptions for each taxon are based on those of Barneby (1977), Isely (1990), and Allison and Stevens (2001) with modifications incorporating measurements taken from the specimens studied. The lists of specimens examined are limited to one record from each county.

Herbarium specimens were initially divided into groups based on overall morphological similarity and the species concepts established by Isely (1990), Ward (2004), and Weakley (2012). Morphological measurements were then made from selected specimens of each group. Field studies were also conducted to observe the species in their natural habitats and make personal collections.

Results

Eight species of *Dalea* occur in Alabama. The most common taxa in the state are *D. pinnata* var. *triloba*, *D. purpurea*, and *D. candida*, represented in 17, 15, and 13 counties, respectively. *Dalea albida* has been reported from seven counties, *D. gattingeri* from six counties, and *D. mountjoyae* from five counties. The least common taxon, the federally endangered *D. foliosa*, occurs in two counties, and the Alabama endemic *D. cahaba* has been reported from only one county.

TAXONOMIC TREATMENT OF *DALEA* IN ALABAMA

Dalea Lucanus, Opera Var. 244. 1758, nom. cons. [not *Dalea* P. Brown 1756 or *Dalea* Miller 1754]

Dalea L., Hort. Cliff. t. 22. 1738.
Kuhnistera Lam., Ency. Meth. 3: 370. 1791.
Parosela Cav., Descr. Pl. 185, 620. 1802.
Petalostemon Michx., Fl. bor.-amer. 2: 49, t. 37. 1803.
Cylipogon Raf., J. Phys. Chim. Hist. Nat. Arts 89: 97. 1819.
Jamesia Raf., Atl. J. 145. 1832.
Asagraea Baill., Adansonia 9: 232. 1870.

Annual or perennial, glandular herbs. **Stems** spreading, decumbent, ascending or erect, glabrous or pubescent. **Leaves** alternate, odd-pinnate, petioled or subsessile; leaflets 3-41, entire, estipellate, cuneate-obovate, elliptic or oblong to linear-filiform; stipules lanceolate to setiform, semipersistent. **Inflorescence** terminal spikes or heads, sessile to long-peduncled, numerous flowers, compact or loosening in fruit; involucre bracts present or absent; interfloral bracts conspicuous before anthesis, tips straight or recurved, persistent or caduceus; bracteoles minute or obsolete. **Calyces**

lobes often subequal, short or exceeding tube; corolla <10 mm long, nonpapilionaceous to subpapapilionaceous, standard broad, cordate to obovate and scoop-shaped; androecium monadelphous, stamens 5 or 9–10. **Fruits** indehiscent, partly or completely enclosed in persistent calyx. **Seeds** 1.

KEY TO THE ALABAMA SPECIES OF *DALEA*

1. Spikes corymbosely aggregated, capitate, surrounded by an involucre of 3–4 series of sterile bracts ..... 1. **Dalea pinnata** var. **trifoliata**
1. Spikes not corymbosely disposed, ovoid to cylindric, sterile bracts absent.

2. Leaflets 15–25, 2.5–3.5 times longer than wide ..... 2. **Dalea foliosa**
2. Leaflets 3–9, 3–12 times longer than wide.

3. Plants, especially spikes, pubescent; leaflets involute or tubular; corolla purple or pink.

4. Leaflets 5–7(–9); spikes elongating and loosening in fruit, commonly becoming sinuous, interfloral mostly bracts deciduous ..... 3. **Dalea gattingeri**
4. Leaflets 3–5; spikes compact in fruit, interflora bracts persistent.

5. Interfloral bracts pubescent along keel and margins; plants decumbent to ascending; stems normally branching below middle ..... 5. **Dalea cahaba**
5. Interfloral bracts pubescent in a transverse band; plants spreading or decumbent; stems normally branching above middle ..... 6. **Dalea purpurea** var. **purpurea**

3. Plants glabrous (calyx lobes occasionally pubescent); leaflets broad and flat or narrow and involute; corolla pink or white.

6. Calyx tube not incised on ventral side; blade of standard broad and cordate 4. **Dalea candida**
6. Calyx tube deeply incised on ventral surface; blade of standard obovate, scoop shaped.

7. Plants spreading or decumbent; axillary fascicles mostly absent, leaflets 5–7, flat or folded; interfloral bract tips recurved in buds; plants of moist areas ..... 7. **Dalea mountjoyae**
7. Plants ascending to erect; axillary fascicles present, leaflets 3–5, flat or folded; interfloral bract tips straight in bud; plants of dry areas ..... 8. **Dalea albida**

1. **Dalea pinnata** (J.F. Gmelin) Barneby var. **trifoliata** (Chapm.) Barneby, Mem. New York Bot. Gard. 27: 279. 1977. *Petalostemon corymbosum* Michx. var. *trifoliatum* Chapm., Fl. South, U.S., ed. 3. 101. 1897. *Petalostemon pinnatum* (J.F. Gmel.) S.F. Blake subsp. *trifoliatum* (Chapm.) Wemple, Iowa State J. Sci. 45: 27. 1970.

Dalea corymbosa Poir. *in* Cuvier, Dict. Sci. Nat. 12: 462. 1819, nom. illegit.

Dalea kuhnistera Willd., Sp. Pl. 3: 1337. 1802, nom. illegit.

Kuhnia pinnata J.F. Gmel., Syst. Nat. 2: 375. 1791. *Kuhnistera pinnata* (J.F. Gmel.) Kuntze, Revis. Gen. Pl. 1: 192. 1891.

Kuhnistera caroliniensis Lam., Encycl. 3: 370. 1792, nom. superfl.

Perennial herbs. **Stems** ascending to erect, 0.4–1 m tall, glabrous. **Leaflets** 3(-5), linear or filiform, 3–6 mm long, 0.7–1 mm wide, mostly folded or involute-terete. **Inflorescence** spikes pubescent, corymbosely aggregated, capitate, sessile; involucre bracts present, 3–4 series; interfloral bracts ciliate along margins, shorter than calyces. **Calyces** 4.5–8 mm long, pilose, lobes setiform,

subequal, exceeding tube, plumose. **Corolla** 5–6.5 mm long, nonpapilionaceous, white, standard lanceolate; stamens 5. Figure 1.

Native of southeastern United States. Habitat and distribution in Alabama: Sandhills, woodlands and roadsides; throughout the southern one-third of the state.

Specimens examined. **Baldwin Co.**: *Wolf 2623*, 25 Aug, 1926 (AUA). **Bullock Co.**: *Diamond 6441*, 28 Jul 1989 (AUA). **Butler Co.**: *Diamond 14221*, 5 Oct 2003 (TROY). **Clarke Co.**: *Kral 44897*, 6 Oct 1971 (BRIT). **Coffee Co.**: *Martin 297*, 8 Oct 1999 (TROY). **Conecuh Co.**: *Diamond 12675*, 22 Sep 2001 (TROY). **Covington Co.**: *Crawford s.n.*, 20 Sep 1979 (TROY). **Crenshaw Co.**: *Richburg 2*, 26 Oct 2000 (TROY). **Dale Co.**: *Pennington 125*, 12 Sep 1999 (TROY). **Escambia Co.**: *Diamond 17015*, 3 Oct 2006 (TROY). **Geneva Co.**: *Kral 33799*, 6 Oct 1968 (BRIT). **Henry Co.**: *Kral 37995*, 18 Oct 1969 (BRIT). **Houston Co.**: *Kral 69729*, 25 Sep 1982 (UWAL). **Mobile Co.**: *Kral 29713*, 8 Oct 1967 (BRIT). **Pike Co.**: *Hall 30*, 11 Nov 1999 (TROY). **Russell Co.**: *Kral 44212*, 17 Sep 1971 (BRIT). **Washington Co.**: *Kral 37269*, 21 Sep 1969 (BRIT).

2. **Dalea foliosa** (A. Gray) Barneby, Mem. New York Bot. Gard. 27: 245. 1977. *Petalostemon foliosus* A. Gray, Proc. Amer. Acad. Arts 7: 336. 1867. *Kuhnistera foliosa* (A. Gray) Kuntze, Rev. Gen. 1: 192. 1891.

Perennial herbs. **Stems** ascending to erect, 0.4–0.7 m tall, glabrous. **Leaflets** 15–25, elliptic to oblanceolate, 5–10 mm long, 1.5–5 mm wide, usually flat. **Inflorescence** spikes pubescent, cylindric, 1.5–4.5 cm long; peduncles absent to 2 cm long; involucre bracts absent; interfloral bracts minutely ciliate, subequal to calyx at anthesis. **Calyces** 3.5–4 mm long, ventrally incised, lobes deltate to subulate, subequal, shorter than tube; corolla 5–6 mm long, nonpapilionaceous, lavender to purple, standard suborbicular; stamens 5. Figure 2.

Native of eastern and southern United States. Habitat and distribution in Alabama: Openings in cedar glades and along streams.

Specimens examined. **Franklin Co.**: *Baskin & Caudle 509*, 23 Aug 1969 (BRIT). **Morgan Co.**: *Baskin & Caudle 517*, 23 Aug 1969 (BRIT).

3. **Dalea gattingeri** (Heller) Barneby, Mem. New York Bot. Gard. 27: 273. 1977. *Kuhnistera gattingeri* Heller, Bull. Torrey Club 23: 121, pl. 262. 1896. *Petalostemon gattingeri* (Heller) Heller, Bull. Torrey Club 26: 593. 1899.

Perennial herbs. **Stems** decumbent or ascending, 0.2–0.4 m tall, villosulous. **Leaflets** 5–7(-9), oblong-oblanceolate, linear to terete-filiform, 8–15(-18) mm long, 0.6–1.8 mm wide, involute-rolled. **Inflorescence** spikes pubescent, cylindric, 2–7 cm long, elongating and loosening in fruit, often becoming sinuous; peduncles absent to 2.5 cm long; involucre bracts absent; interfloral bracts villosulous, exserted, mostly deciduous. **Calyces** 4–5 mm long, villosulous, lobes ovate to lanceolate, usually subequal and shorter than tube. **Corolla** 5–6.2 mm long, nonpapilionaceous, purple, standard suborbicular or oblate, proximally cuneate or subcordate; stamens 5. Figure 3.

Native of southeastern United States. Habitat and distribution in Alabama: Cedar glades.

Specimens examined. **Cherokee Co.**: *Diamond 3343*, 5 Jun 1987 (AUA). **Colbert Co.**: *Whetstone 16523*, 15 May 1993 (JSU). **Franklin Co.**: *England 802*, 13 Jun 2008 (TROY). **Hale Co.**: *Mohr s.n.*, 28 May 1893 (UNA). **Lawrence Co.**: *Keener & Spaulding 2823*, 17 Apr 2006 (TROY). **Morgan Co.**: *Spaulding 11986*, 6 Jul 2003 (TROY).

4. **Dalea candida** Michx. ex Willd., Sp. Pl. 3: 1337. 1802. *Petalostemum candidum* Michx. ex Willd., Fl. Bor.-Amer. 2: 49. 1803. *Psoralea candida* (Michx. ex Willd.) Poir., *in* Lam. Encycl. Meth. 5: 694. 1804. *Dalea candida* (Michx. ex Willd.) Poir., Dict. Sci. Nat. 13: 462. 1818. *Kuhniastera candida* (Michx.) Kuntze, Rev. Gen. 192. 1891.

Perennial herbs. **Stems** erect or ascending (decumbent), 0.3–1.0 m tall, glabrous. **Leaflets** 5–9, elliptic to oblanceolate, 8–25 mm long, 0.9–6.3 mm wide, flat or partly folded. **Inflorescence** spikes glabrous, ovoid or conical to cylindric, (1-)2–8 cm long; peduncles 5–10(-15) cm long; involucre bracts absent; interfloral bracts glabrous, subequal to calyces at anthesis. **Calyces** 3–4 mm long, not ventrally incised, lobes subulate or deltate, subequal, shorter than tube. **Corolla** 4.2–5.7 mm long, nonpapilionaceous, white, standard broad and cordate; stamens 5. Figure 4.

Native of central and eastern United States. Habitat and distribution in Alabama: Prairies, glades, barrens, open woodlands.

Specimens examined. **Autauga Co.**: *Gunn 686*, 14 Jun 1982 (BRIT). **Colbert Co.**: *Webb 4080*, 27 Jun 1981 (BRIT). **Dallas Co.**: *Keener 3727*, 23 Jun 2007 (TROY). **Franklin Co.**: *Webb 4060*, 27 Jun 1981 (BRIT). **Greene Co.**: *Harper 3426*, 30 Jul 1935 (UNA). **Hale Co.**: *Keener 2250*, 6 Jun 2002 (TROY). **Lawrence Co.**: *Kral 31716*, 20 Jul 1968 (BRIT). **Lowndes Co.**: *Diamond 14014*, 9 Jul 2003 (TROY). **Marengo Co.**: *England 2417*, 30 May 2010 (TROY). **Perry Co.**: *Keener 2934*, 4 Jun 2006 (TROY). Pickens Co.: *Keener 3737*, 30 Jun 2007 (TROY). **Sumter Co.**: *Kral 39762*, 27 Jun 1970 (UNA). **Wilcox Co.**: *Diamond 14565*, 6 Aug 2004 (TROY).

5. **Dalea cahaba** J. Allison, Castanea 66: 154. 2001.

Perennial herbs. **Stems** decumbent or weakly ascending, branching below middle, 0.1–0.7 m tall, glabrous, pilosulous to sinuous. **Leaflets** 3–5, linear to linear-oblanceolate, 5–20 mm long, 0.6–2.3 mm wide, marginally inrolled to tightly involute. **Inflorescence** spikes densely pilosulous, globose to oblong cylindroid or subglobose, 0.5–2.8 cm long; peduncles 1.5–8.5 cm long; involucre bracts absent; interfloral bracts pilosulous along the keel and margins, equal or longer than the calyx at anthesis. **Calyces** 4–5 mm long, not ventrally incised, lobes lance-acuminate to lance-ovate, equal or longer than tube. **Corolla** 3.5–5.3 mm long, nonpapilionaceous, rose-purple, standard ovate; stamens 5. Figure 5.

Native of Alabama. Habitat and distribution in Alabama: Dolomite glades.

Specimens examined. **Bibb Co.**: *Allison 7718*, 13 Jun 1993 (AUA).

6. **Dalea purpurea** Vent. var. **purpurea**, Descr. Pl. Cels, Pl. 40. 1800. *Psoralea purpurea* (Vent.) Poir., Enc. Meth. V. 694. 1804. *Kuhnistera purpurea* (Vent.) MacMillan, Metasp. Minn. Vall. 329. 1892.

Dalea violacea Michx. ex Willd., Sp. Pl. 3: 337. 1802. *Petalostemon violaceus* Michaux, Fl. Bor. Amer. 2: 50. 1803. *Kuhnistera violacea* (Michx.) Ait. ex Steud., Nomencl. Ed. 2, 1: 851. 1840.

Petalostemon violaceum var. *pubescens* Gray, Pl. Wright. 1: 46. 1852. *Petalostemon pubescens* (Gray) A. Heller, Muhlenbergia 1: 28. 1904.

Petalostemon mollis Rydb., Mem. N.Y. Bot. Gard. 1: 238. 1900.

Petalostemon pubescens A. Nels., Bot. Gaz. 31: 395. 1901. *Petalostemon purpurea* var. *pubescens* (A. Nels.) Harrington, Man. Pl. Colo. 319. 1954.

Petalostemon purpureum fma. *arenarium* F.C. Gates, Torreya 11: 127. 1911.

Petalostemon standleyanus Rydb., N. Amer. Fl. 24: 131. 1920.

Petalostemon purpureum fma. *albiflorum* Horr & McGregor, Trans. Kans. Acad. Sci. 55: 175. 1952. *Dalea purpurea* fma. *albiflora* (Horr & McGregor) McGregor, Trans. Kans. Acad. Sci. 60: 161. 1957.

Perennial herbs. **Stems** erect or spreading (decumbent), branching above middle, 0.2–0.8 m tall, inconspicuously villosulous. **Leaflets** 3–5, linear-oblanceolate to filiform, 8–15(-20) mm long, 0.6-3.3 mm wide, tightly folded, tubular or involute. **Inflorescence** spikes villosulous, 1.5–7 cm long, initially conic or ovoid, becoming cylindric, but remaining compact and straight; peduncles 0–8(-12) cm long; involucre bracts absent; interfloral bract tips exserted and conspicuous in bud, subequal to calyces at anthesis, body with a transverse band of pubescence. **Calyces** 3.5–4.5(-5) mm long, subappressed or matted-villosulous over entire surface, lobes deltate or subulate, subequal, shorter than tube. **Corolla** 4.5–7 mm long, nonpapilionaceous, red-purple, standard cuneate or truncate-cordate; stamens 5. Figure 6.

Native of central and eastern United States and adjacent Canada, and Alabama, Arkansas, Kentucky, Louisiana, Mississippi, and Tennessee. Habitat and distribution in Alabama: Prairies, glades, open woodlands.

Specimens examined. **Autauga Co.**: *Gunn 685*, 14 Jun 1982 (BRIT). **Cherokee Co.**: *Landers s.n.*, 8 May 1975 (JSU). **Colbert Co.**: *Kral* 67596, 26 Jul 1981 (TROY). **Dallas Co.**: *Kral 82395*, 21 May 1993 (BRIT). **Franklin Co.**: *Webb 4061*, 27 Jun 1981 (BRIT). **Greene Co.**: *Keener 4523*, 27 May 2008 (TROY). **Hale Co.**: *Allison 6902*, 19 Jul 1992 (UNA). **Lawrence Co.**: *Kral 31717*, 20 Jul 1968 (BRIT). **Lowndes Co.**: *Kral 86032*, 10 Jun 1996 (BRIT). **Marengo Co.**: *England 2418*, 30 May 2010 (TROY). **Marion Co.**: *Tomlin s.n.*, 19 Jun 1992 (UNAF). **Morgan Co.**: *Whetstone 17880*, 27 Jun 1996 (JSU). **Pickens Co.**: *Keener 3736*, 30 Jun 2007 (TROY). **Sumter Co.**: *Keener 3212*, 10 Jul 2006 (TROY). **Wilcox Co.**: *Diamond 21326*, 20 May 2010 (TROY).

7. **Dalea mountjoyae** M. Woods, Phytoneuron 2013-23: 1. 2013. *Petalostemon gracile* Nutt., J. Acad. Nat. Sci. Philadelphia 7: 92. 1834. *Kuhnistera gracilis* (Nutt.) Kuntze, Revis. Gen. Pl. 1: 192. 1891. *Dalea carnea* (Michx.) Poir. var. *gracilis* (Nutt.) Barneby, Mem. New York Bot. Gard. 27: 256. 1977. *Dalea gracilis* (Nutt.) D.B. Ward, Novon 14: 369. 2004.
Petalostemon bicolor Bert., Mem. Reale Accad. Bologna 2: 273, t. 13(1). 1850.

Perennial herbs. **Stems** spreading or decumbent, 0.4–0.8 m tall, glabrous, branching below middle, sparsely foliose with widely spaced leaves that usually lack axillary fascicles. **Leaflets** 5(-7), oblong to oblanceolate, 7–17 mm long, 0.9–5.7 mm wide, flat or folded. **Inflorescence** spikes glabrous, 0.7–1.5 cm long, ovoid or ovid-conic; peduncles 4–15 cm long; involucre bracts absent; interfloral bracts equal or longer than calyces, tips recurved in bud, ciliate along margins. **Calyces** 2.9–3.3 mm long, villosulous, deeply incised on upper side, lobes subulate, subequal, shorter than tube. **Corolla** 3.8–4.5 mm long, nonpapilionaceous, white, standard obovate, scoop-shaped; stamens 5. Figure 7.

Native of southern Alabama, western Florida Panhandle, southwestern Louisiana, and southern Mississippi. Habitat and distribution in Alabama: Moist areas, wet pine savannahs.

Specimens examined. **Baldwin Co.**: *Kral 56639*, 21 Sept 1975 (BRIT). **Covington Co.**: *Kral 44292*, 17 Sep 1971 (BRIT). **Escambia Co.**: *Diamond 2867*, 6 Sep 1986 (AUA). **Geneva Co.**: *MacDonald & Hays s.n.*, 19 Sep 1998 (BRIT). **Mobile Co.**: *Mohr 320*, 14 Aug 1878 (UNA).

8. **Dalea albida** (Torr. & A. Gray) D.B. Ward, Novon 14: 369. 2004. *Petalostemon carneum* Michx. var. *albidum* Torr. & A. Gray, Fl. N. Amer. 1: 311. 1838. *Petalostemon albidum* (Torr & A. Gray) Small, Fl. S.E. U.S. 630, 1332. 1903. *Dalea carnea* (Michx.) Poir. var. *albida* (Torr. & A. Gray) Barneby, Mem. New York Bot. Gard. 27: 255. 1977.

Perennial herbs. **Stems** ascending to erect, 0.3–2 m tall, glabrous, branching above middle, sparsely or closely foliose, commonly with axillary fascicles. **Leaflets** 3–5, spatulate-oblanceolate to obovate, 6–15 mm long, 0.7–5 mm wide, flat or folded. **Inflorescence** spikes glabrous, 0.5–1.5 cm

long; involucre bracts absent; interfloral bracts equal or longer than calyces, tips straight in bud, ciliate along margins. **Calyces** 3–4 mm long, villosulous, deeply incised on upper side, lobes subulate, subequal, shorter than tube. **Corolla** 3.8–4.5 mm long, nonpapilionaceous, white or pink-purple, standard obovate, scoop-shaped; stamens 5. Figure 8.

Native of Upper Florida Peninsula, Georgia, and Alabama. Habitat and distribution in Alabama: Dry areas, woodlands, sand ridges, glades, right of ways.

Specimens examined. **Autauga Co.**: *Gunn 686*, 14 Jun 1982 (AUA). **Baldwin Co.**: *Wolf s.n.*, 25 Aug 1926 (AUA). **Barbour Co.**: *Kral 33191*, 11 Sep 1968 (BRIT). **Hale Co.**: *Thomas 1708*, 18 Jun 1968 (UNA). **Henry Co.**: *Smith 325*, *s.d.* (UNA). **Montgomery Co.**: *Mohr s.n.*, 14 Jul 1880 (UNA). **Wilcox Co.**: *Gunn 847*, 23 Jun 1982 (UNA).

DISCUSSION

In Alabama, *Dalea* is a taxon of barrens, cedar glades, chalk glades, dolomite glades, limestone glades, floodplains, prairies, roadsides, river banks, sandy pine woodlands, and scrub oak woodlands. The state and global ranked taxa have more restricted habitats. *Dalea cahaba* occurs on dolomite glades near streams, while *D. foliosa* and *D. gattingeri* are found primarily on cedar and limestone glades, respectively.

A combination of morphological characteristics can be used to differentiate the eight species of *Dalea* in Alabama. *Dalea pinnata* and *D. foliosa* are the most easily recognized taxa. *Dalea pinnata* has corymbosely aggregated spikes, whereas, the remaining taxa have spikes that are ovoid to cylindric and not corymbosely disposed. *Dalea foliosa* has 15-25 leaflets and the remaining taxa have 3-9 leaflets. In Alabama, *D. pinnata* is represented by *D. pinnata* var. *trifoliata*. The common *Dalea purpurea*, the rare *D. gattingeri* and the endemic *D. cahaba* are the most difficult to distinguish between. Growth habit is an important characteristic of these three taxa. *Dalea purpurea* is an ascending to erect plant whose stems branch above the middle, whereas, *D. gattingeri* and *D. cahaba* are decumbent to weakly ascending and are typically branched below the middle. However, the most reliable character used to recognize *D. purpurea* is the transverse band of pubescence on the interflora bracts. In both *D. gattingeri* and *D. cahaba* the pubescence occurs along the keel and margin of the bracts. *Dalea gattingeri* differs from *D. cahaba* with its longer spikes (2-7 cm), which become sinuous and most of the interfloral bracts abort in fruit. The spikes of *D. cahaba* are shorter (0.5-2.8 cm), which remain densely packed in fruit and the interfloral bracts are persistent.

Dalea candida also resembles *D. purpurea* in growth habit. However, the leaflets of *D. candida* are flat or partly folded and the leaflets of *D. purpurea* are tightly folded, tubular or involute. Additionally, the flowers of *D. candida* are white versus the red-purple flowers of *D. purpurea*. All of the specimens of *D. purpurea* studied during this project were of the typical variety.

Two other taxa easily confused are *Dalea mountjoyae* and *D. albida*, but they can be distinguished based on habitat, growth habit, and differences in both vegetative and reproductive structures. *Dalea mountjoyae* occurs in moist areas, bogs, and pine savannahs, is spreading or decumbent, axillary fascicles of leaves absent, or few, and interfloral bract tips recurved in bud. *Dalea albida* occurs in dry, disturbed woodlands, sand ridges and glades, is ascending to erect, axillary fascicles of leaves present and interfloral bract tips straight in bud. *Dalea candida* also resembles *D. albida* in that both grow in dry habits, have similar leaflets and white flowers. However, they differ in that *D. candida* occurs on limestone and is more erect than the ascending *D. albida*, which grows in sandy soils.

Dalea cahaba, which is not federally listed but has an S2G2 rank, appears to be well protected. In 1996, The Nature Conservancy purchased land to create the Bibb County Glades

Preserve, which protects almost half of the glades where this taxon is known to occur. Additionally, in 2003, the U.S. Fish and Wildlife Service purchased land adjacent to these glades and created the Cahaba River National Wildlife Refuge. With continuing efforts by both The Nature Conservancy and the U.S. Fish and Wildlife Service to expand the refuge, *D. cahaba* and several other rare taxa should be protected for future generations.

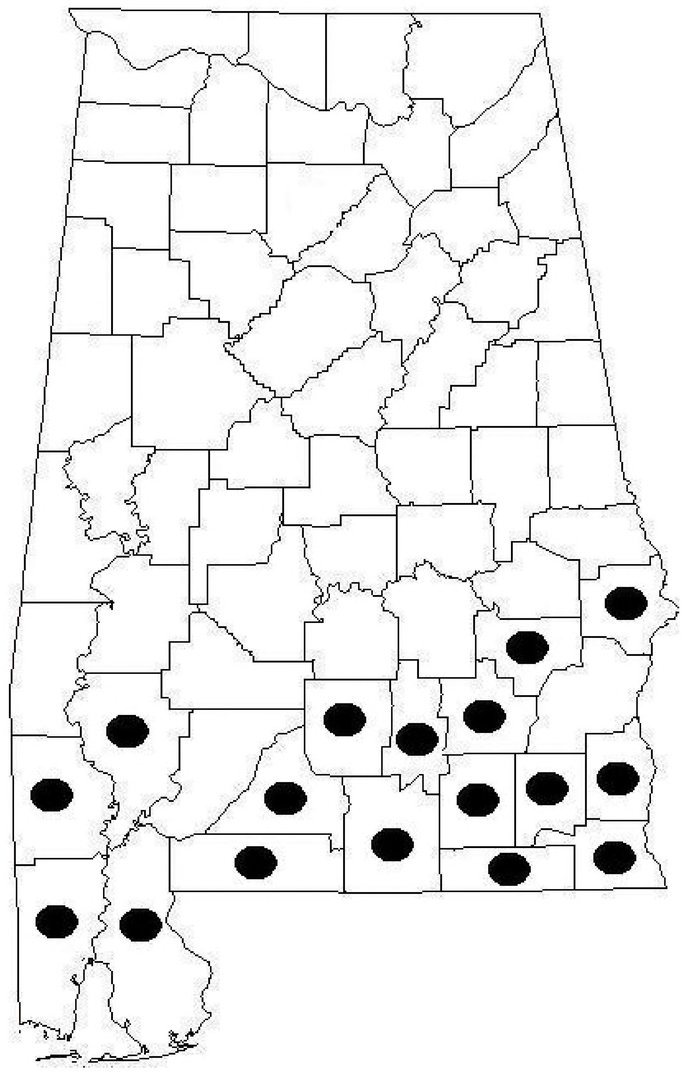

Figure 1. *Dalea pinnata* var. *trifoliata*, distribution.

Figure 2. *Dalea foliosa* (courtesy BRIT), distribution.

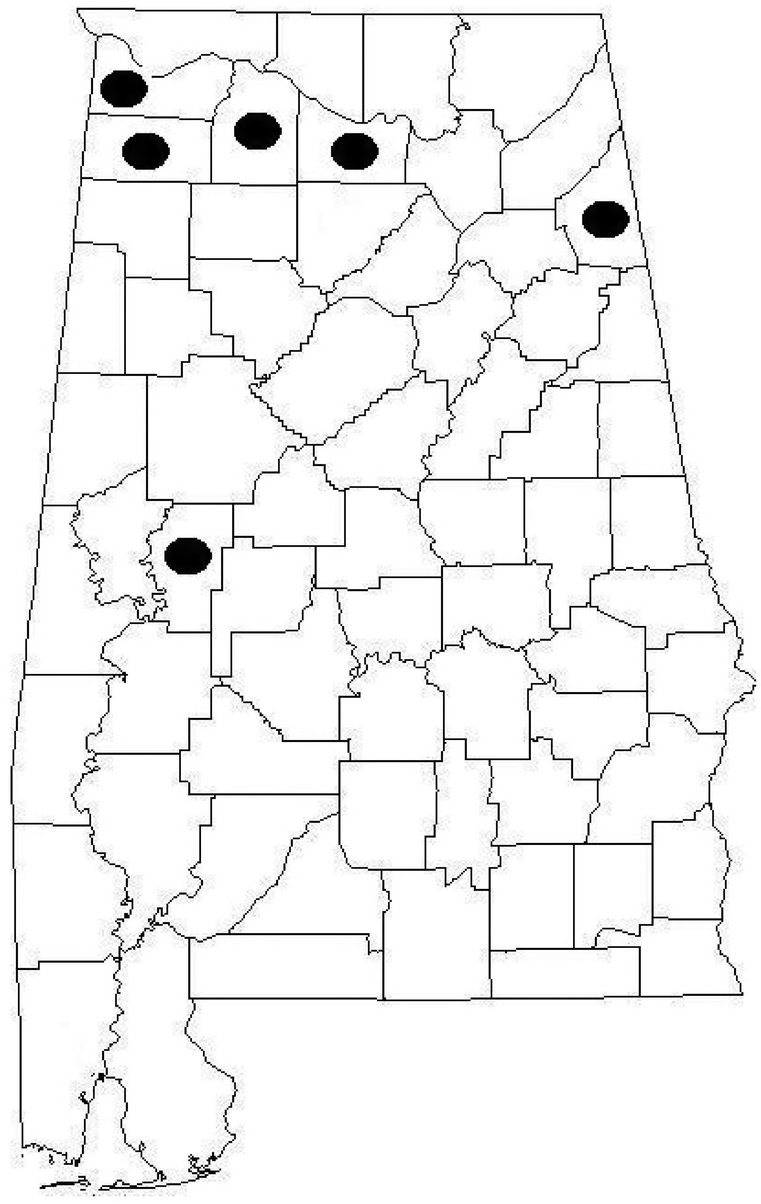

Figure 3. *Dalea gattingeri*, distribution.

Troy University Herbarium
TROY000019185
TROY UNIVERSITY HERBARIUM
TROY NO: 25518
HERBARIUM OF THE UNIVERSITY OF WEST ALABAMA
PLANTS OF UNITED STATES
ALABAMA
FABACEAE
Dalea candida Michx. ex Willd. var. candida
Prairie. Dominated by Red Cedar. Chalky soil.
DALLAS COUNTY: 1.5 air mi. WSW of Cahaba. Along Co. Rd 9 about 0.25 mi. N of jct with Co. Rd. 2 (Cahaba Road).
32°18'44"N 87°07'33"W
23 Jun 2007
Brian R. Keener 3727
with Eric St. Clair
KODAK Color Control Patches
KODAK Gray Scale

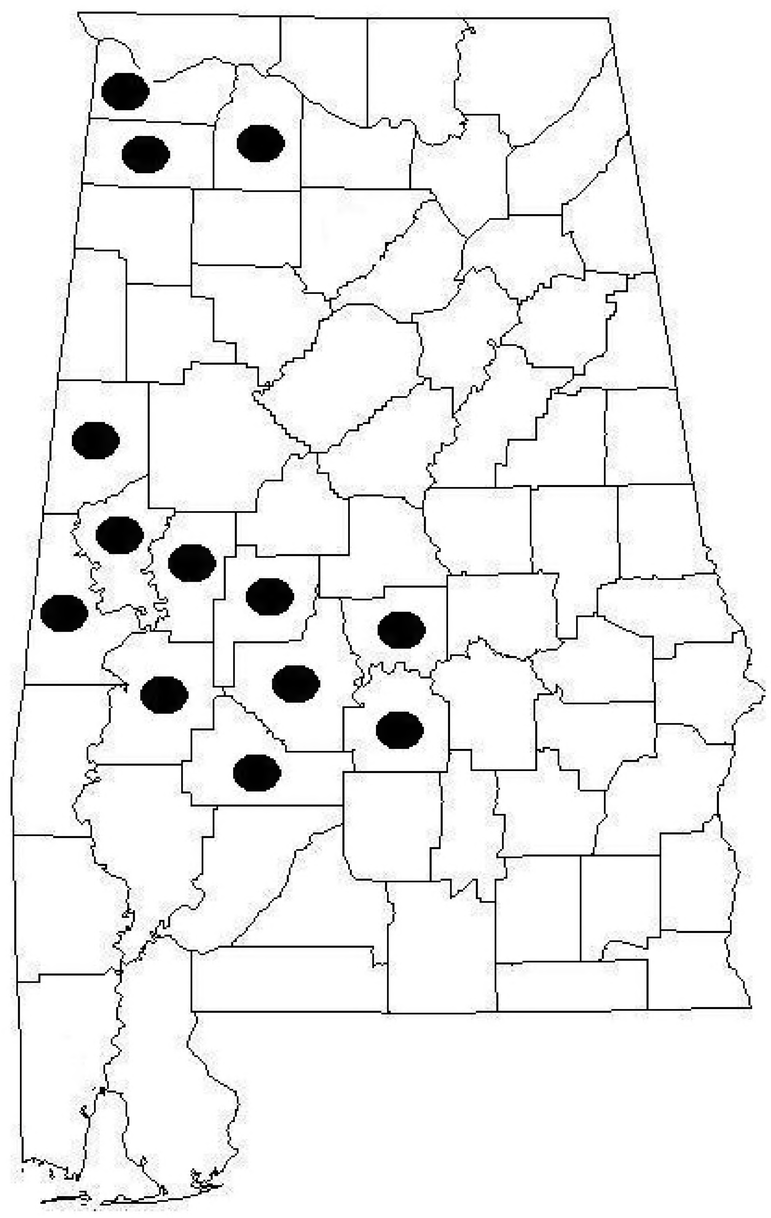

Figure 4. *Dalea candida*, distribution.

Figure 5. *Dalea cahaba*, distribution.

TROY UNIVERSITY HERBARIUM
TROY NO: 33155
Troy University Herbarium
TROY000032128
PLANTS OF ALABAMA
Wilcox County
FABACEAE
Dalea purpurea Vent.
Un-numbered dirt road ca. 0.25 mile north of Prairie Bluff Road at large cedar glade on the west side of the Alabama River. With B. Keener and W. Webb.
32° 8'12.80"N 87°24'15.50"W. Elevation 143 ft.
A. R. Diamond #21326 20 May 2010
Troy University Herbarium (TROY)

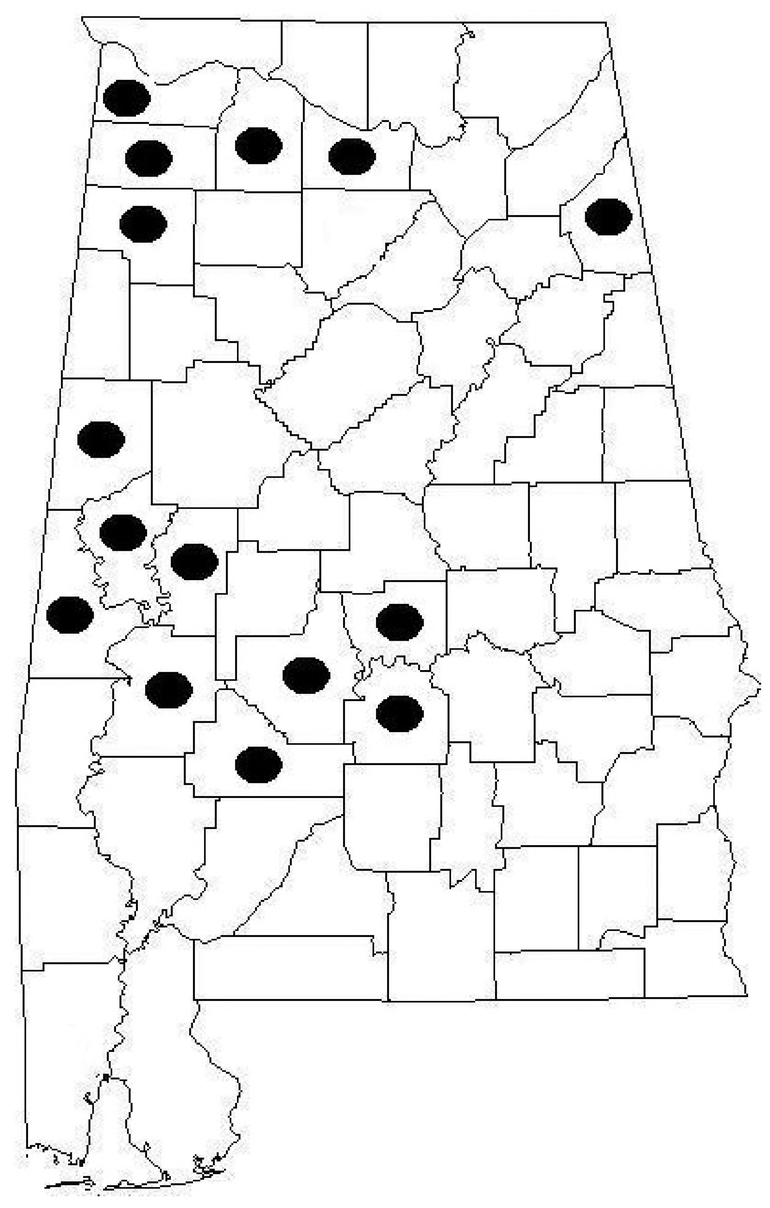

Figure 6. *Dalea purpurea*, distribution.

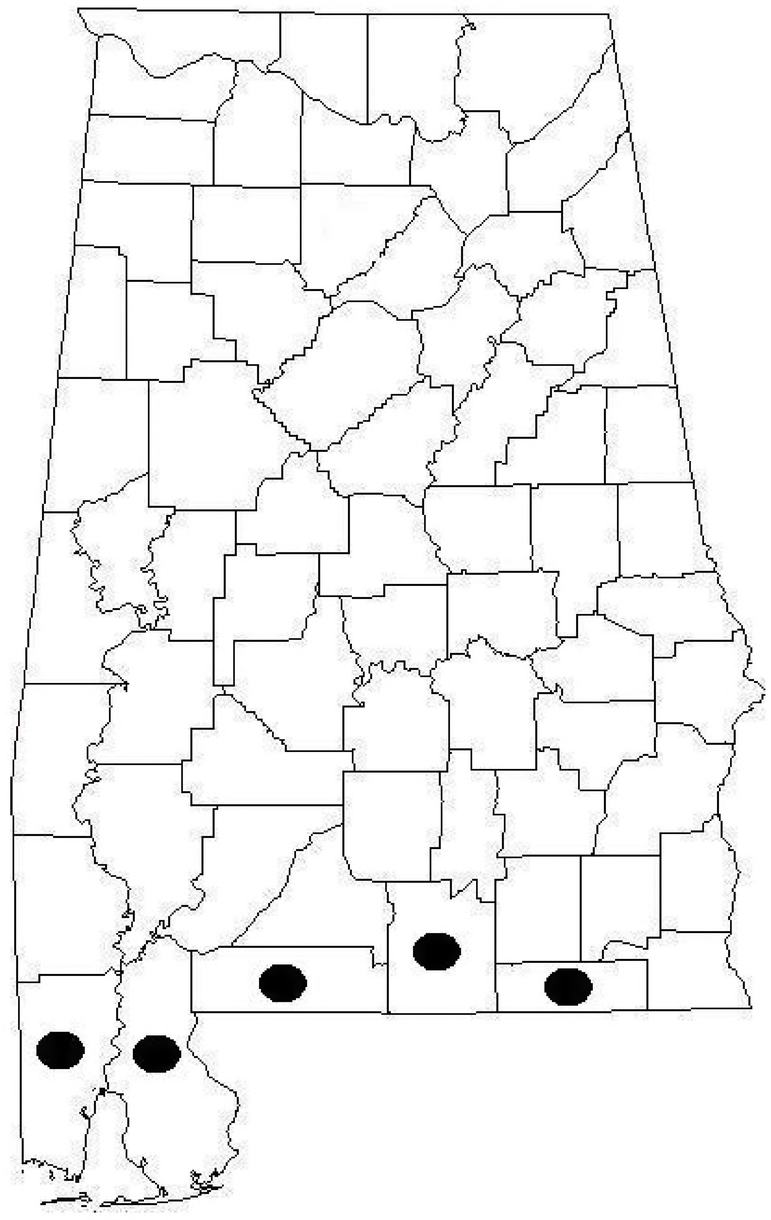

Figure 7. *Dalea mountjoyae*, distribution.

John D. Freeman Herbarium (AUA)
AUA000011385
=Dalea carnea (Michx.) Poiret
var. albida (Torr. & Gray) Barneby
AUA January 2001
FABACEAE
PLANTS OF ALABAMA
Autauga County
Petalostemum albidum (T. & G.) Small
Jones Bluff, approx. 4 mi. N Jones Bluff Dam, on west shore of Alabama River, near Statesville, in T16N, R13E, Sec. 8.
Common in dry, grassy, prairie clay soil on bluff face; in full sun.
S. C. Gunn 723 15 June, 1982
COLLECTED AND DISTRIBUTED THROUGH AUBURN UNIVERSITY
AUBURN UNIVERSITY HERBARIUM AUA 39084

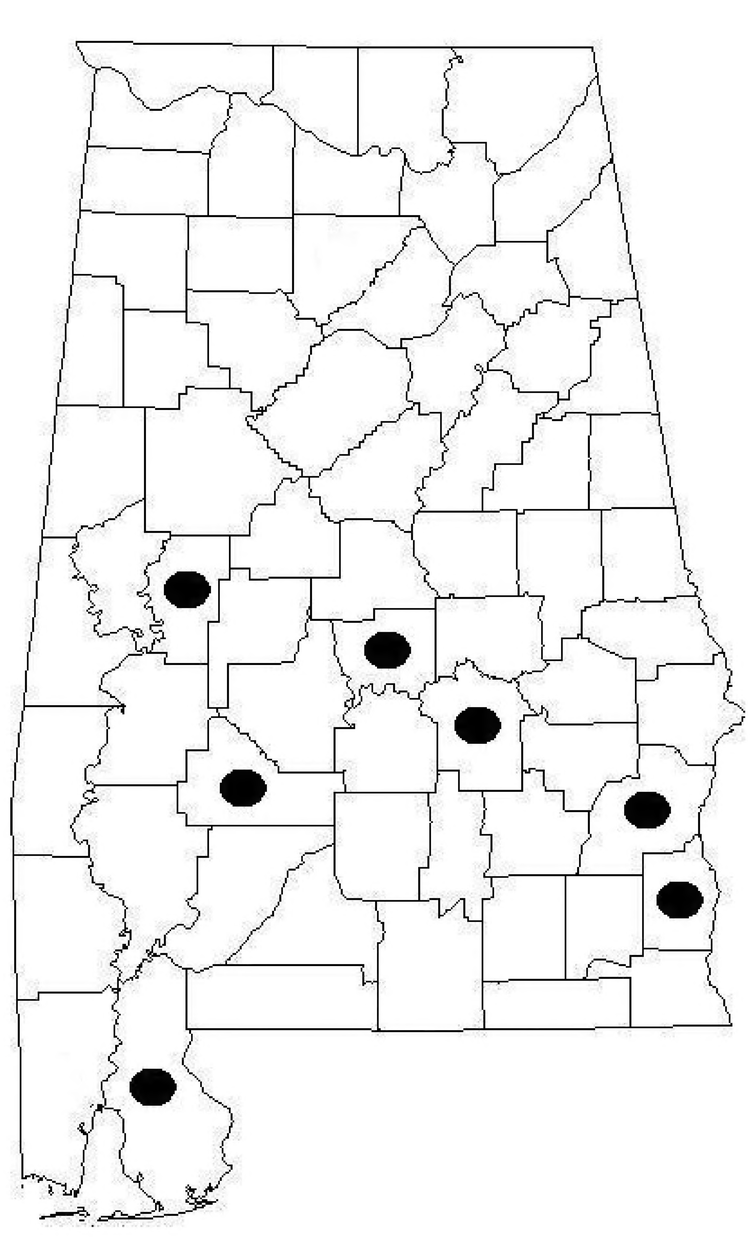

Figure 8. *Dalea albida* (courtesy BRIT), distribution.

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